

### **3.3 LAND USE**

This land use analysis evaluates how SPR development might affect existing land characteristics and uses at each potential new and expanded SPR site and associated infrastructure in direct or indirect ways. The section is organized as follows: methodology, common impacts, affected environment and potential impacts for each site and its infrastructure, and the no-action alternative.

#### **3.3.1 Methodology**

DOE identified the existing land use conditions at each potential new or expanded SPR site and assessed potential land use impacts in the following four areas:

- Possible land use conflicts,
- Visual resources,
- Prime farmland, and
- Coastal zone management.

The approach to assessing each of these impact topics is discussed below.

The effects of Hurricanes Katrina and Rita on existing conditions are also noted in this section as appropriate. In August and September of 2005, these two hurricanes passed through the Gulf Coast region and affected environmental conditions in the vicinity of several existing and proposed new and expansion sites and their associated infrastructures in Louisiana, Mississippi, and Texas. To understand how the hurricanes affected existing conditions, DOE consulted with affected parties in these areas during the subsequent EIS scoping process and in meetings with other Federal, state, and local agencies. DOE assessed site observations following the hurricanes, reviewed information gathered from scoping, and conducted other research regarding changes in the affected environment from the hurricanes. In general, although the hurricanes caused extensive damage at and near some proposed facility locations, they did not change the character of the lands as rural and largely undeveloped. Thus, changes in the long-term uses of such lands as a result of the 2005 hurricanes are unlikely and not yet apparent.

##### **3.3.1.1 Possible Land Use Conflicts**

To understand potential land use conflicts from SPR development, DOE assessed land uses for a 2-mile (3.2-kilometer) radius around each proposed new or expansion storage site, RWI structure, pipeline route, power line, road, and oil distribution terminal and tank farm. For each proposed storage site, DOE based the affected environment section on previous SPR site characterization studies (e.g., DOE 1979, 1992; Magorian and Neal 1990; Maggorian et al. 1991; Neal 1993; Sprehe 2003) and updated information from site visits and data evaluation conducted in late 2005 and early 2006. DOE examined the land vegetation and land use classification types that could be affected during the construction and operation of each proposed new or expansion storage site and the associated infrastructure. DOE assessed potential conflicts with residential and commercial land uses and areas with special designations such as U.S. Forest Service lands; wildlife refuges; wilderness areas; wild and scenic rivers; scenic areas, roads, or trails; and parks. As part of this analysis, DOE assessed potential constraints and management controls at the county or parish, state, and Federal levels. The only major land use controls that were identified in this analysis were requirements regarding coastal zone management, which are discussed as a separate topic below.

DOE's evaluation of the magnitude of the potential land use conflicts takes into account the amount of land potentially affected, the type of land use that would be affected, the duration of the potential impact,

and the extent of the conflict. It also considers the actions that DOE would take as part of the proposed action to help avoid or reduce land use conflicts and other land use impacts, including the following:

- Placing new pipeline and power lines in existing ROWs to the maximum extent feasible;
- Avoiding specially designated areas and consulting with affected agencies to minimize effects on these areas;
- Burying pipelines except when crossing levees;
- Revegetating and restoring the land as quickly as possible and where feasible;
- Storing equipment and materials in established storage areas;
- Providing the public with a construction schedule;
- Establishing community liaisons to work with affected landowners and public to resolve problems;
- Providing effective and efficient access to work sites with minimum interference to public;
- Painting buildings and structures in appropriate colors; and
- Shielding affected areas from public view where feasible.

#### **3.3.1.2 Visual Resources**

Any activity that introduces new or changed forms, lines, colors, and textures to the environment would have an impact on the visual character and quality of the area. DOE evaluated the potential visual impacts of the possible SPR activities by considering the types of site users and other project locations, amount of use, public interest in the particular visual landscapes, adjacent land uses, and the existence of specially designated areas, as described above. The construction and operation of each proposed new or expansion storage site, RWI structure, pipeline, power line, road, oil distribution terminal, and tank farm may cause contrasts with the existing landscape. For this analysis, DOE presumed that viewers would be more sensitive to visual contrasts on lands with special designations, such as national forests or wildlife refuges, which may be visited more often and serve a greater aesthetic or uniquely scenic purpose. The impact analysis also recognizes that throughout the region of influence for the various SPR storage sites, pipelines and industrial facilities are common, which would limit the contrast with the existing visual setting caused by SPR expansion.

#### **3.3.1.3 Prime Farmland**

DOE's actions in selecting sites for SPR program expansion could result in the temporary or long-term loss of land having certain soil or other natural resource characteristics that are of high value. Prime farmland is a resource that could be lost or damaged by surface-disturbing activities or conversion of land from one use to another. The Farmland Protection Policy Act (7 USC 4201 to 4209; 7 CFR Part 658) seeks to minimize Federal programs' contribution to unnecessary and irreversible conversion of farmlands to nonagricultural uses. Compliance with this law requires DOE to identify and consider adverse effects of the proposed action on the preservation of farmland, appropriate alternative actions that would lessen adverse effects on farmlands, and as far as practicable, ensure that the proposed action would be compatible with state, local and private programs and policies to protect farmland.

To comply with the Farmland Protection Policy Act, DOE has consulted with the offices of the U.S. Department of Agriculture's Natural Resource Conservation Service (NRCS) offices in Louisiana, Mississippi, and Texas to identify and evaluate prime farmlands that would be affected by SPR expansion. Using NRCS's rating system, DOE calculated farmland conversion impact scores for each proposed site and associated infrastructure and for each alternative considered in this draft EIS.

#### **3.3.1.4 Coastal Zone Management**

The Coastal Zone Management Act (CZMA) was enacted in 1972 to encourage coastal states to develop comprehensive programs to manage and balance competing uses of and impacts to coastal resources. The CZMA emphasizes the primacy of state decision making regarding the coastal zone. Section 307 of the CZMA addresses the consistency requirements for both states and the Federal Government and allows states to manage coastal uses and resources and facilitate cooperation and coordination with Federal agencies. It requires Federal agency activities with reasonably foreseeable effects on any land or water use or natural resource of the designated coastal zone to be consistent, to the maximum extent practicable, with the enforceable policies of a coastal state's Federally approved coastal management program. The lead state agency that implements or coordinates a state's federally approved coastal management program is responsible for Federal consistency reviews. All three affected states in this EIS have primacy for the CZMA, and each has developed a Coastal Management Program.

DOE has consulted with the appropriate state agencies—namely the Louisiana Department of Natural Resources, Coastal Management Division; the Texas General Land Office, Coastal Resources Program; and the Mississippi Department of Marine Resources—to understand their concerns and issues regarding the proposed SPR sites and associated infrastructure that could be located in coastal zones. The consultation process with these agencies is still in progress. The agencies preferred that DOE coordinate its required coastal consistency determination for the selected alternative with both the applicable state agencies and with the USACE, which will have Clean Water Act Section 404 permitting responsibilities. The applicable state agencies in Texas, Louisiana, and Mississippi often use joint review processes with the USACE on permit applications affecting lands within the designated coastal zone. USACE will forward the determination to the coastal zone management agencies, which would conduct a consistency review and either object or concur with DOE's determination. This process satisfies the requirements of the Federal Coastal Zone Management Act.

#### **3.3.2 Impacts Common to Multiple Sites**

The construction and operations and maintenance of a new or expanded SPR site and associated infrastructure would involve many similar activities across similar proposed locations. Using the methodology described above, DOE analyzed the likely impacts that might be common to all or most proposed new and existing storage sites and their infrastructure. Those impacts are discussed in this section. Additional site-specific impacts are discussed in sections 3.3.3 through 3.3.11.

##### **3.3.2.1 Possible Land Use Conflicts**

###### ***Storage Sites***

The use of land for SPR petroleum storage purposes at any of the new or expansion storage sites generally would preclude the future use of that land for other purposes. SPR land use at the storage sites would include establishment of a buffer around the storage sites (except at the Clovelly storage site) and other security measures. The buffer for each site would generally consist of a cleared area 300 feet (91 meters) beyond the outer security fenceline for line-of-site surveillance. SPR site access would be limited to those persons who require access for official SPR purposes. With the exception of the Clovelly site, which would share some facilities with LOOP operations, DOE would have exclusive use of the storage sites.

The proposed new Bruinsburg, Chacahoula, Clovelly, Clovelly-Bruinsburg combination, Richton, and Stratton Ridge storage sites would require construction of new petroleum storage facilities, as described

in chapter 2. These sites have limited value for non-industrial purposes. Nonetheless, the potential conflicts for each proposed new site are analyzed in sections 3.3 through 3.8.

Expansion of storage capacity at Bayou Choctaw, Big Hill, and West Hackberry would require acquiring existing caverns or constructing new caverns. Because SPR storage facilities already exist on these salt domes, there would be no land use conflicts from expanding storage capacity. These sites have limited value for nonindustrial purposes. In addition, less construction would take place at the proposed expansion storage sites than at the proposed new storage sites because DOE would use existing support facilities and infrastructure. The likelihood of land use conflict at the existing storage sites is further limited because these sites are not located in or immediately adjacent to specially designated or protected areas, commercial areas, or residential areas. Thus, DOE does not expect land use conflict at the three expansion storage sites.

### ***Pipelines***

As described in chapter 2, all proposed new and expansion SPR sites, except Clovelly, Bayou Choctaw, and West Hackberry, would require new pipeline infrastructure for water, brine, or petroleum. The existing pipeline infrastructure in the Gulf Coast region is extensive, and pipelines generally result in limited land use conflicts if they are located in existing corridors or in rural areas away from population centers. Where feasible, DOE has proposed pipeline routes that are not near residential or commercial areas and would not cross lands with special designations or purposes. Maximum feasible use of existing ROWs would reduce possible land use conflicts because construction would be required only to widen an existing, maintained corridor, and any land use change would be limited to the construction period at that location and the expansion of the ROW. The width of pipelines easements would vary with the type of terrain the pipeline crosses (e.g., upland or wetland) and other characteristics. Construction easements would range from 50 to 100 feet (15 to 30 meters) for a single pipeline and 120 to 150 feet (30 to 46 meters) for multiple pipelines. Permanent easements would be 50 feet (15 meters) for one pipeline and 50 to 100 feet (15 to 30 meters) for multiple pipelines.

With the exception of pipelines crossing levees, DOE would bury pipelines. Buried pipelines would create some temporary surface disturbance and trenching, but in the long term, land use impacts would be limited. A pipeline ROW would preclude some land uses that would involve excavation or could otherwise damage the pipeline. Other uses, including recreation, hunting, and most agriculture would still be allowed. Pipelines would traverse levees aboveground, and these pipelines would be designed to have no effect on levee operation and would not pose land use conflicts.

Operations and maintenance activities associated with pipeline ROWs include inspections, mowing of nuisance vegetation along the pipeline ROW, and maintaining grass covers to prevent erosion. Section 2.3.10 describes these operations and maintenance activities. These activities generally would not create land use conflicts, except possibly where pipelines cross land with special designations for the Bruinsburg, Clovelly-Bruinsburg combination, Richton, and Stratton Ridge. These three situations are discussed in the site-specific sections below.

### ***Electric Power Lines***

The construction and operation of new electric transmission and distribution lines would be required for proposed new sites, but not the expansion sites. The ROWs would be relatively narrow, with a maximum width of 100 feet (30 meters). All new electric transmission poles and lines, with one exception, would be constructed along ROWs or roads that already exist or would be built to support new SPR pipelines; the general level of land use impact or conflict for these power lines would be low. The exception would be a 5.5-mile (8.6 kilometer) power line from the Bruinsburg site to the Grand Gulf substation would be

in a new ROW by itself. This ROW would be through rural, largely forested habitat. The potential land use impacts may be higher where the power lines would cross lands with special designations or in residential areas. As described further below, this would occur for the proposed Bruinsburg, Clovelly-Bruinsburg combination, Richton, and Stratton Ridge sites.

### ***RWI Facilities***

DOE would construct new RWI systems for all potential new sites except Clovelly, where a RWI system already is located onsite. RWI systems would not affect any nearby specially designated or protected lands, residential areas, or commercial areas at the other new sites with the exception of the Stratton Ridge site. The proposed RWI site at Stratton Ridge would be located within and along the shoreline of the ICW across from the border of the Brazoria National Wildlife Refuge. Potential for land use conflicts associated with the construction and operations and maintenance of the Stratton Ridge RWI system is discussed in section 3.3.8.

The proposed expansion sites have existing RWI facilities. The facilities at Bayou Choctaw and Big Hill, however, would be upgraded if the sites were selected for expansion. Because the expansion of the RWI systems would not constitute a change in existing land uses, it would not constitute a conflict. The West Hackberry site would use the existing RWI system with no changes; therefore, it would not pose any land use conflicts.

The operation and maintenance of all new and expanded RWI systems are not expected to have long-term impacts on surrounding water that could affect commercial or recreational fishing. Sections 3.7 and 3.10 further discuss the potential impacts of the construction and operations and maintenance of the RWI systems on biological resources and noise.

### ***Brine Discharge***

Brine from Chacahoula, Clovelly, Richton, and Stratton Ridge would be discharged into the Gulf of Mexico. New brine disposal pipelines would be built for all new sites, except Clovelly where an existing system would be used. For Big Hill, the existing system would be upgraded.

Sections 3.6 and 3.7 address the potential for the construction and operation of the offshore brine disposal system to affect water quality, navigation, aquatic organisms, and commercial fishing operations. Any land use conflicts from this construction would be limited to the location of the offshore pipeline during the brief period for constructing that pipeline segment. Permanent land use conflicts would not arise because the brine pipelines and diffusion system would not limit access to the Gulf of Mexico or harm recreational or commercial resources. Thus, the site-specific land use analysis does not discuss offshore brine disposal land use conflicts.

Brine from Bruinsburg, including under the Clovelly-Bruinsburg alternatives, Bayou Choctaw, and West Hackberry would be disposed of in underground injection wells. New wells would be constructed for these sites, except West Hackberry. The new wells for the new sites would constitute a new land use, as is discussed in the site-specific analysis. For the Bayou Choctaw expansion site, DOE would build six new wells near an area with existing underground injection wells. This upgrading of existing systems at the expansion sites would not constitute a change in existing land uses.

### ***Terminals and Tank Farms***

New tank farms and other facilities at oil distribution terminals would be required at the following locations:

- Anchorage, LA, and Peetsville, MS, for the Bruinsburg site;
- Jackson, MS, for the Bruinsburg site as part of the Clovelly-Bruinsburg combination alternatives;
- Pascagoula, MS, and Liberty Station, MS, for the Richton site; and
- Texas City, TX, for the Stratton Ridge site.

The terminals at Anchorage, Liberty Station, Pascagoula, and Texas City would be located in existing industrial areas and therefore would not present a change in existing land uses. The terminals at Jackson and Peetsville would be located in rural areas where the terminals would represent new land uses but would not be likely to conflict with existing land uses. The potential land use conflicts for these terminals are discussed in the site-specific analyses below.

### **3.3.2.2 Visual Resource Impacts**

#### ***Storage Sites***

SPR storage sites would include storage caverns created in large salt domes and a variety of support facilities and infrastructure. The layout of these facilities is illustrated in sections 2.3 and 2.4. While a large number of viewers would not see the storage site areas because public access would be limited, the sites would appear industrial in nature and contrast with surrounding natural vegetation.

Construction activities at new or expanded SPR storage sites might result in temporary visual impacts from new buildings, trenches, construction equipment emissions, access roads, night lighting, and dust. Construction activities would result in long-term changes to the existing landscape. Visual impacts also might arise from operations and maintenance of buildings and associated infrastructure, lighting, fencing, and cleared areas. Buildings and facilities at the SPR storage sites would generally be designed and constructed for their safety and functionality, not for their visual appeal. Because the potential new storage sites would generally not be observable from specially designated, commercial, or residential areas, there would be limited visual conflict and contrast. The Bruinsburg storage site, discussed in the site-specific analyses below, could have a higher magnitude of visual impacts because of its proximity to areas with higher visual sensitivity.

The expansion of Bayou Choctaw, Big Hill, and West Hackberry would not provide a large visual contrast with the existing landscape because of the existing industrial land use at these sites. In addition, because less construction would take place at the three existing SPR storage sites, the visual effects of such construction would be smaller in magnitude than the changes associated with the new sites. Also, none of the expansion storage sites is located in specially designated land, commercial, or residential areas.

#### ***Pipelines***

The construction of pipelines and the operations and maintenance of pipeline ROWs would change the character of vegetation across the new or expanded ROWs. Where new pipelines would be built in developed areas, they would be located below public property such as roads and other ROWs. New or expanded ROWs would be cleared and grubbed, which would require removing and trimming of any trees and removing surface vegetation, rubbish, and existing structures. While these activities might result in visual contrasts with the existing landscape, the peak of impact would be during construction activities, which would last from six to ten weeks at any point along a pipeline. The contrast would be substantially reduced after construction is complete and the ROW is revegetated or otherwise restored. DOE would give all possible consideration to preserving trees in the ROW. DOE also would grade the ROW to facilitate laying the pipeline and would build temporary facilities such as roads and sand bridges for use during pipeline construction.

Operations and maintenance activities would involve the mowing of nuisance vegetation along ROWs, maintaining grass covers, or constructing and maintaining terraces, plugs, and bulkheads. These activities would cause visual contrasts with the landscape, which would be more substantial at close viewing range and would diminish with longer range. Views of pipelines and pipeline ROWs are quite common in this region, especially in Louisiana and Texas, which may limit the contrast with the existing visual setting caused by new pipelines. Overall, any visual contrast would be minimal, except possibly where the pipelines are in specially designated areas, such as parks. Pipelines associated with the proposed Bruinsburg, Bruinsburg portion of the Clovelly-Bruinsburg combination, Richton, and Stratton Ridge sites would traverse lands with such special designations. The potential visual impacts for these pipeline segments are discussed in the site-specific analyses below.

DOE would bury all pipelines except those traversing levees, which would minimize visual contrasts with the existing landscape. Pipelines would traverse levees aboveground, and these pipelines would add new characteristics to the views of the levees. When identifying proposed pipeline routes, DOE selected routes along existing pipeline ROWs, power line ROWs, and roads to the extent practicable. Expansion of existing ROWs would provide less contrast with the existing landscape because the incremental visual changes would be small.

The construction and operations and maintenance of new ROWs would result in a greater visual contrast with the existing landscape than the expansion of existing ROWs. The number of viewers who could observe the new pipeline ROWs would likely be limited because, with few exceptions, they would be located in rural areas. In the few instances where pipelines would cross developed areas, the long-term visual impacts would be small because these ROWs would follow existing ROWs such as roads.

### ***Electric Power Lines***

New electric power and lines would be required for the proposed new SPR sites. All new power lines, with one exception, would be constructed along existing ROWs or roads, or along ROWs or roads that would be built to support new pipelines. The exception would be the 5.4-mile (8.7-kilometer) power line from the Bruinsburg site to the Grand Gulf substation, which would be through rural, largely forested habitat. The new power lines might pose a visual contrast with the existing landscape. Relatively few people, however, are likely to view these power lines because the ROWs are located in rural areas that lack unique visual characteristics of special interest to the public. In general, the potential visual impacts associated with lines and poles in rural areas would be associated with a continuation of urbanization and development, and not directly associated with SPR development.

The power lines and poles associated with the Bruinsburg, the Bruinsburg portion of the Clovelly-Bruinsburg combination, and Stratton Ridge sites could interact with specially designated lands and therefore might have a greater potential visual impact, as discussed in the site-specific analyses.

### ***RWI Facilities***

A typical RWI structure would be a steel and concrete platform sufficiently elevated to withstand a 100-year flood. A fence with security lights would surround the entire structure. The construction and operations and maintenance of new RWI systems would contrast with the visual landscape of the water body and adjoining land. While they may constitute a change in the viewshed, RWI systems that are not located near specially designated lands, commercial, or residential areas would have few potential viewers. Of the new SPR sites, only the proposed RWI site for Stratton Ridge would have potential visual impact issues. It would be located within and along the shoreline of the ICW across from the border of the Brazoria National Wildlife Refuge. Potential visual impacts associated with this system are discussed in section 3.3.8.3 below.

Expanding the RWIs for existing facilities would provide little visual contrast, considering the present infrastructures and their existing impacts on the visual landscape. Because the West Hackberry site would use the existing RWI system, no additional visual impacts would occur there.

### ***Brine Discharge***

The brine from all new and expansion sites except Bruinsburg, the Bruinsburg portion of the Clovelly-Bruinsburg combination, Bayou Choctaw, and West Hackberry would be discharged into the Gulf of Mexico. The discharge would have little visual impact because the brine would not be visible. In addition, brine discharges are not expected to have substantial effects on nearby plants and fish, as discussed in section 3.7.

At the three SPR expansion sites—Big Hill, Bayou Choctaw, and West Hackberry—the existing brine discharge systems would be upgraded, which would not contrast greatly with the existing landscape and, therefore, would have a low level of visual impact.

The Bruinsburg brine discharge system would require the construction of 60 new underground injection wells offsite, each requiring 230 square feet (21 square meters) of land. For the Bruinsburg portion of the Clovelly-Bruinsburg combinations, 30 wells would be constructed. While there may not be a large number of viewers of the Bruinsburg well sites, they would appear industrial and would contrast with the existing viewscape.

### ***Terminals and Tank Farms***

The new tank farms and other terminal facilities at Anchorage, Pascagoula, and Texas City would be located in existing industrial areas and would provide little visual contrast to the existing landscape. Potential viewers of these facilities would not likely be visually sensitive to any changes in the viewshed. The new tank farms at Peetsville, Jackson, and Liberty Station would be located in rural areas. These new facilities would contrast with the existing forested and agricultural landscape, as discussed in the site-by-site analysis.

#### **3.3.2.3 Prime Farmland Impacts**

SPR development activities would cause farmland conversion by shifting the use of land to nonfarm uses, with irretrievable losses occurring when the land is developed and committed to other uses for the long-term. Any prime or unique farmlands located on proposed SPR storage sites, RWI facilities, and oil distribution terminals would be permanently converted to nonfarm uses because the potential use of that land for agricultural purposes would be lost.

The construction of pipelines and power lines would temporarily prohibit agricultural use of farmland within the construction easement during the construction period of up to six to ten weeks at any specific location. With proper management practices, the impacts of new or expanded ROWs would be small and would not convert farmland to nonagricultural uses. These practices would include the following:

- Consultation with landowners and farms to address field access, irrigation, revegetation, timing, and other sensitive cropping issues;
- Stripping and segregating topsoil from subsoil when digging trenches and grading agricultural lands, and replacing the segregated topsoil after the trench is backfilled and the subsoil is restored to grade; and

- Restoring and returning land temporarily affected by construction to agricultural use.

DOE, in consultation with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), scored all of the individual sites and all of the alternatives using the farmland conversion impact rating. This scoring system is specified in the Farmland Protection Policy Act regulations (7 CFR Part 658). It considers a wide variety of factors related to potential farmland conversion impacts, including the amount of prime or unique farmland that would be converted; the amount of statewide and locally important farmland; the use of the land and nearby land; the distance to urban built-up areas and urban support services; on-farm investments; and compatibility with existing agricultural use. Under the Farmland Protection Policy Act regulations, "sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated" (40 CFR 658.4(c)(2)). All of the proposed new and expansion sites and all of the alternatives have scores less than 160 and need not be given further consideration for protection.<sup>1</sup> Thus, the site-by-site analysis below does not address farmland.

#### **3.3.2.4 Coastal Zone Management Impacts**

For those sites and associated infrastructure that would be located in designated state coastal zones, DOE would be required to comply with the applicable parts of each state's Coastal Management Program. Coastal zone management is an important local and regional planning tool to limit the potential adverse effects on coastal resources. The types of problems that can occur from development within coastal resources include accumulation of contaminants and pollutants, coastal erosion, land loss, loss of wetlands, and a decline in the natural functioning of habitats and natural resource relationships. Use of lands for SPR purposes in coastal zones would not be expected to cause any major Coastal Management Program concerns, except for impacts on wetlands at some sites. Specific coastal zone management issues and processes relevant to the various SPR sites within coastal zones are identified in the site-specific discussions. The Bruinsburg and Bayou Choctaw sites and infrastructure are not located within designated coastal zones and therefore would not be affected by coastal management processes. The other sites and/or their infrastructure are located in coastal zones. See figures 3.3.2-1 through 3.3.2-3 below for maps showing the locations of designated coastal zone management areas for Louisiana, Mississippi, and Texas relative to the proposed storage sites and associated infrastructure.

### **3.3.3 Bruinsburg Storage Site**

#### **3.3.3.1 Affected Environment**

The Bruinsburg salt dome is located in Claiborne County, MS, about 3 miles (4.8 kilometers) east of the Mississippi River. See figures 2.4.1-1 through 2.4.1-3 in chapter 2. With about 70 percent of the land area in the County forested, timber production is an important regional land use. The hardwood forests also provide hunting and fishing opportunities. Agriculture is also an important industry in the County.

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<sup>1</sup> The location of some of the proposed sites and their infrastructure changed slightly since DOE consulted with NRCS. Additional consultations to incorporate the new information were not feasible for inclusion in this draft EIS. Nonetheless, the nature of these minor changes would not increase the score for any site and its infrastructure to be greater than 160 points.

**Figure 3.3.2-1: Coastal Zone Management Areas in Louisiana**

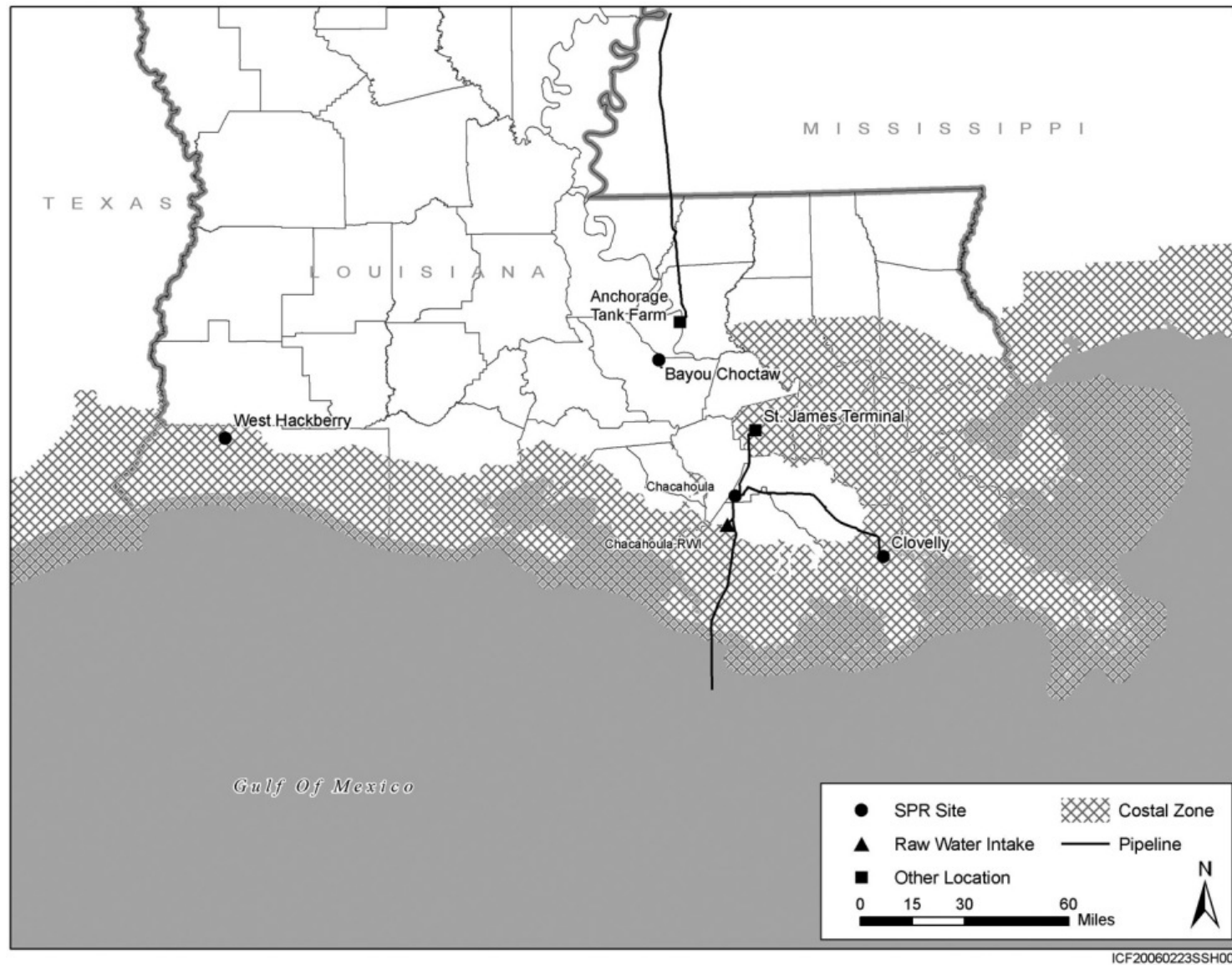
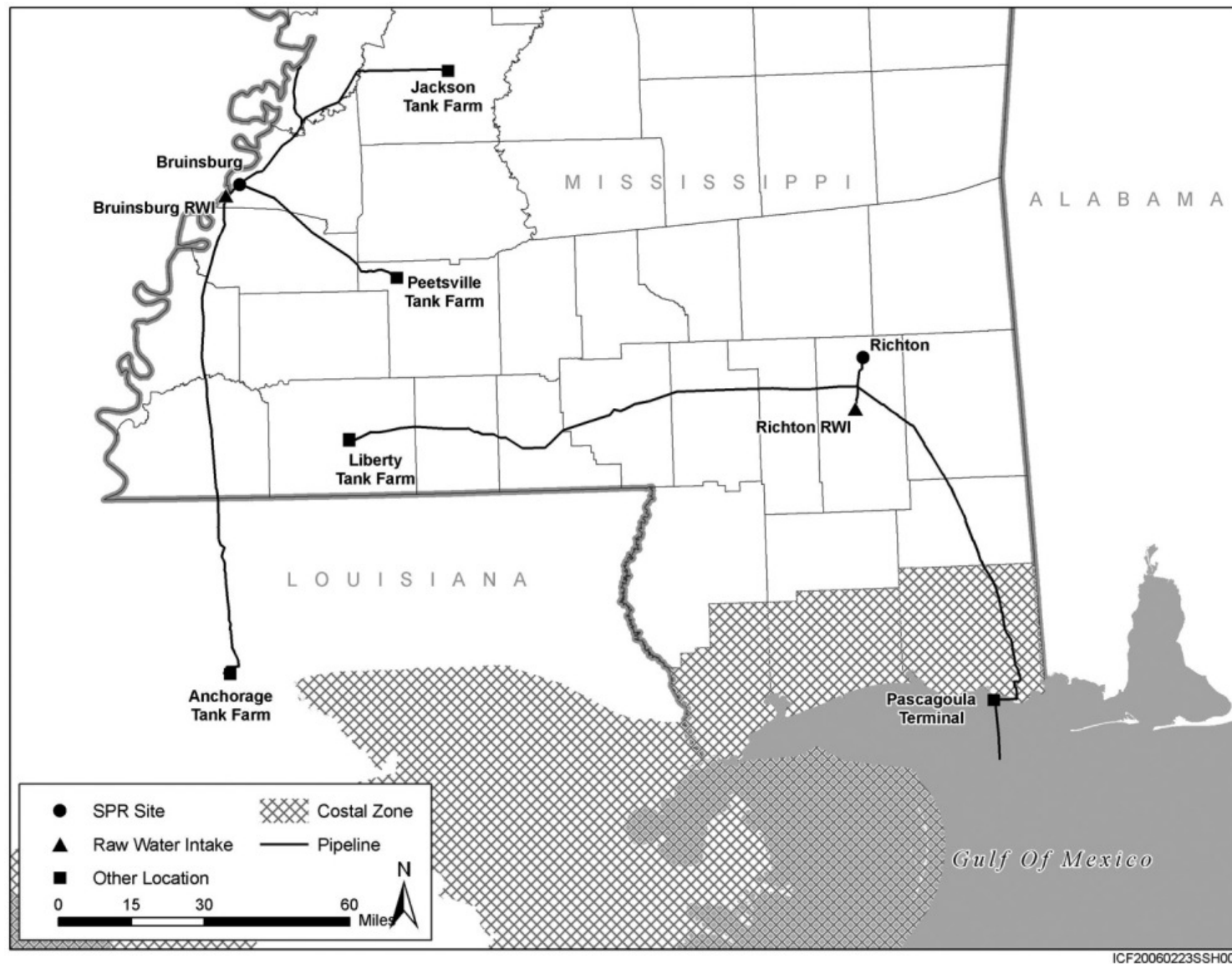
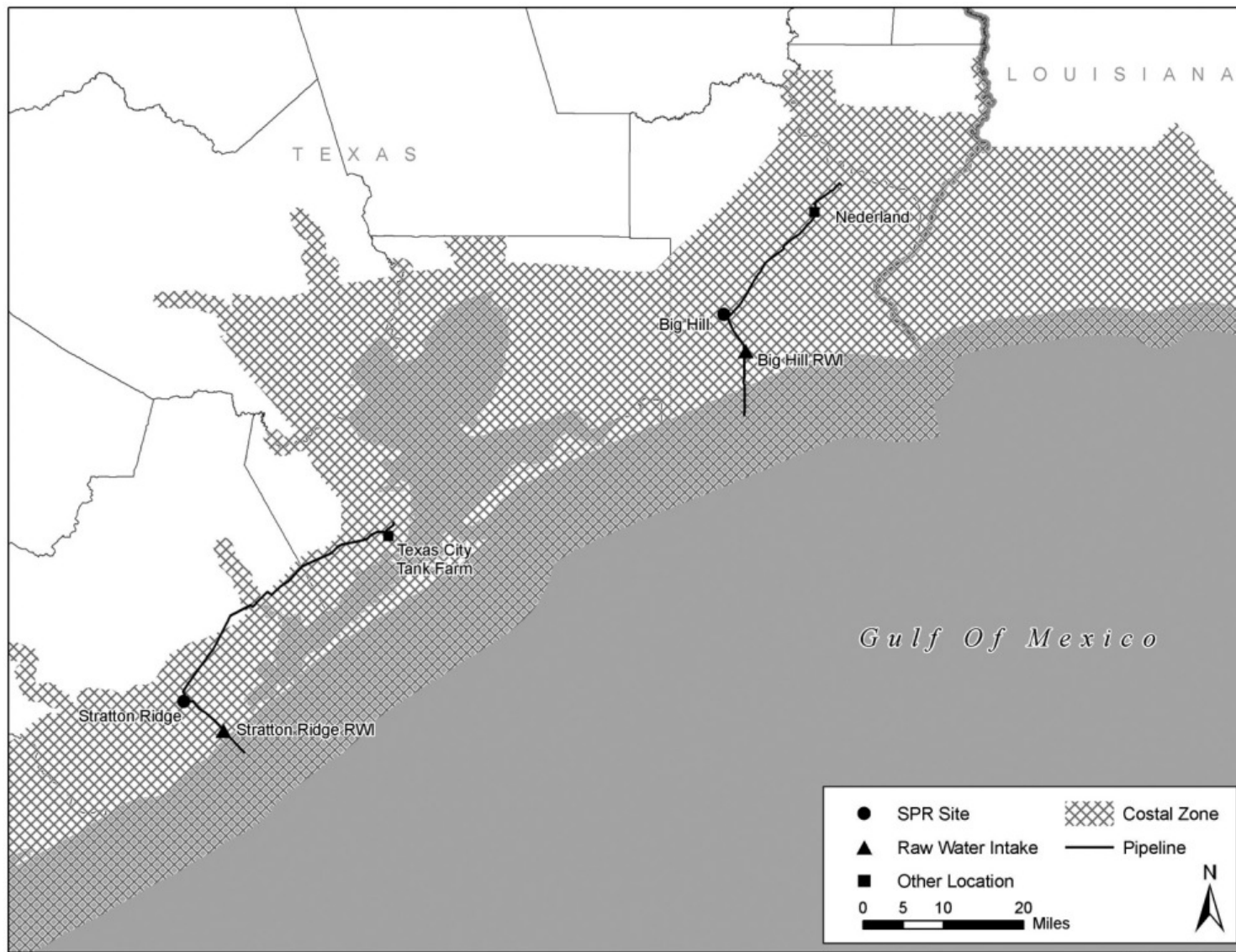


Figure 3.3.2-2: Coastal Zone Management Areas in Mississippi



**Figure 3.3.2-3: Coastal Zone Management Areas in Texas**



The potential Bruinsburg storage caverns would be located on a floodplain where the Union Army, under General Grant, disembarked after crossing the Mississippi River on April 30, 1863. The facilities for the storage site (e.g., administrative buildings, brine pond, pumps) would be located outside the floodplain in an area overlooking the caverns. Section 3.9 discusses further details on the historical nature of the site. The proposed storage site, which is privately owned, would consist of 364 acres (147 hectares) including a 300-foot (91-meter) security buffer. Nearly half of the site is cultivated for producing cotton, corn, hay, soybeans, and wheat. Hunting blinds for deer and other game species are distributed around the perimeter of the cotton fields. The remainder of the site is forested wetlands. It also has a barn and silo. Scattered residences are nearby, with the closest home approximately one-half mile (0.8 kilometers) from the proposed site. The Bruinsburg site would require the development of several pipelines and power lines, as described in section 2.4.1 (see figure 2.4.1-3). These pipelines and power lines would be located in mainly rural areas with some agricultural land and wetlands. The crude oil pipeline ROW to the Peetsville, MS, terminal would cross three special purpose areas:

- Natchez Trace National Scenic Trail is an ancient trail that connected portions of the Mississippi River to salt licks located in central Tennessee. The trail also was used by traders in the late 18th and early 19th centuries. The trail is managed by the National Park Service.
- The Natchez Trace Parkway, a 440-mile (710-kilometer) highway also is managed by the National Park Service.
- The Homochitto National Forest in the southwest Mississippi is managed by the U.S. Forest Service for a variety of recreational, wildlife, and forestry uses. The crude oil pipeline would travel through private property contained within the proclamation boundary of the National Forest.

The Winsor Ruins, a fire-damaged plantation house that is a well-known historic symbol of Mississippi, and prehistoric earthwork sites of potential cultural importance to the Choctaw, are located near the crude oil pipeline to Peetsville, MS. Section 3.9 discusses further details on the historical nature of this area.

Sixty brine disposal wells would be developed offsite on 73 acres (30 hectares) of undeveloped land along the Mississippi. A RWI system on the Mississippi River would be constructed about 4 miles (7 kilometers) east of the site. The water intake structure would be located in an agricultural and forested area, less than 2 miles (3.2 kilometers) from the small town of St. Joseph, LA, on the other side of the river.

The Bruinsburg site would require a new oil distribution terminal with aboveground storage tanks in Anchorage, LA, as shown in figure 2.4.1-5. The proposed 71-acre (28-hectare) terminal would be located south of the Exxon/Mobil and Placid Refineries. The existing land use for the area where the proposed facility would be located is row crop agriculture. Most of the area surrounding the proposed site is currently in industrial, agricultural, and some residential use. A second terminal would be constructed in Peetsville, MS, in a rural, partly forested area, as shown in figure 2.4.1-4. The proposed 71-acre (28-hectare) tank farm would be adjacent to an existing pipeline pump station. Managed forests and scattered rural housing surround the site.

The Bruinsburg area did not receive substantial damage from Hurricanes Katrina or Rita in 2005. The locations of the proposed Bruinsburg pipelines, RWI, and other infrastructure associated with the proposed SPR site were also outside the path of hurricane-force winds.

### **3.3.3.2 Potential Impacts**

#### **3.3.3.2.1 Possible Land Use Conflicts**

The Bruinsburg area has no historical land uses associated with oil and gas development. Only a fraction of the land in the vicinity has been disturbed by railroads, roads, canals, and other infrastructure or development. Considering the nonindustrial and undeveloped nature of the area, the land proposed for potential development of the storage site and the underground injection wells could be used for various purposes. There are no specially designated lands or residential or commercial areas close to these proposed locations. There are no known plans for any significant new land uses in the area. While the proposed SPR storage and injection well sites are undeveloped, general land use patterns would not conflict with the construction or operation of these SPR facilities.

As discussed in the common impacts section 3.3.2 above, the construction and operation of pipelines and power lines would not conflict with existing land uses, save the following two exceptions:

- The crude oil pipeline to the Peetsville Terminal, MS, would cross the Natchez Trace National Scenic Trail and the Natchez Trace Parkway in an existing utility ROW. The expansion of the ROW would require clearing additional vegetation and would slightly expand the scope of the existing land use of the ROW.
  - Mitigation: If the Bruinsburg site were selected for expansion, DOE would coordinate with the National Park Service to obtain the proper ROW easements through the trail and parkway. DOE would work with the National Park Service to ensure that land use conflicts are minimized to the maximum extent practicable.
- The same pipeline would travel through private property contained within the proclamation boundary of the Homochitto National Forest for 6.8 miles (11 kilometers). Approximately 5.6 miles (9 kilometers) of the pipeline would go through a new corridor along highway 550 and the remainder would be along an existing power line ROW. Along these ROWs, vegetation would be cleared and trees would not be allowed to regrow within the 50-foot (15-meter) permanent easement. The remaining area affected by construction would be allowed to regenerate to natural habitat. The pipeline in the existing ROW would slightly expand the existing land use of the ROW. The new ROW along the highway would add a new land use.

The RWI structure would not create any land use conflicts. It would be located in a small undeveloped area with near agricultural and forested areas along the Mississippi River. While less than 2 miles (3.2 kilometers) from the town of St. Joseph, LA, the construction or operation of the structure would not create any land use conflicts because of the town's distance across the Mississippi River.

The proposed new tank farm in Anchorage, LA, would be located on land currently used for row crop agriculture. The site, however, is adjacent to industrial area that already includes tank farms and a petroleum refinery. The construction and operation of the new terminal would create no substantive land use conflicts.

The proposed tank farm in Peetsville, MS, would be located in a rural, partly forested area. While the terminal would create a new land use, this use would not be likely to pose any substantive conflicts with existing land uses in the area.

#### **3.3.3.2.2 Visual Resources**

The development of the Bruinsburg storage site would have a visual impact on recreational sightseers or parties in the Civil War who may be sensitive to changes in the visual quality of the historic landscape. While the proposed storage site is not located in or near special status lands or developed areas, the area has historical significance. A portion of a historic road in or near the facility boundary may be still visible on the floodplain and along the route of on the escarpment. Section 3.9 discusses further details on the historic nature of this area. Construction and operations and maintenance could affect potential viewers who might be sensitive to changes in the existing landscape.

Visual impacts could be associated with the proposed crude oil pipeline to Peetsville, MS, which would cross the Natchez Trace National Scenic Trail, Natchez Trace Parkway, and the privately owned within proclamation boundary of the Homochitto National Forest. These special status and cultural areas may be frequented by sightseers who may be sensitive to changes in visual quality. Construction of the ROWs would cause temporary disruption to the landscape in the form of dust, emissions from construction equipment, and trenches. As part of the proposed action, the pipeline would be underground and DOE would attempt to preserve the natural landscape setting.

The RWI and brine disposal systems associated with the proposed Bruinsburg site are not located in or near special status or developed areas. Few potential viewers of those sites would be affected, and those viewers would be minimally affected because there are no special visual attributes of public interest in the area.

The terminal in Anchorage, LA, would be constructed adjacent to similar industrial facilities. Visual impacts would be low because the area has no special visual resource attributes. The terminal in Peetsville, MS, which would be adjacent to an existing pump station, would change the visual character of the rural and partly forested area. The area, however, would have relatively few viewers and does not have any special scenic views of particular interest to the public, such as national forests or wildlife refuges.

#### **3.3.3.2.3 Coastal Zone Management**

Because the Bruinsburg site, pipelines, RWI and brine disposal systems, and terminals would not be in the designated Mississippi or Louisiana coastal zones, no special coastal zone management requirements are part of any land use at the proposed SPR site.

### **3.3.4 Chacahoula Storage Site**

#### **3.3.4.1 Affected Environment**

The Chacahoula storage site would be located in northwestern LaFourche Parish, LA, about 40 miles (64 kilometers) from the Gulf of Mexico (see figures 2.4.2-1 through 2.4.2-3). The proposed site, which is in wetlands typical of southern Louisiana, would encompass 350 acres (142 hectares) including the security buffer. See Section 3.7 Biological Resources and Appendix B Flood Plains and Wetlands Assessment for discussion of potential development in wetlands. Adjacent lands contain sugar cane fields. No private homes are on or immediately adjacent to the proposed site. Because of its low elevation, the Chacahoula site is vulnerable to storm surges from major tropical storms and heavy precipitation. The land proposed for the SPR site is privately owned with separate owners of the surface and mineral rights.

Hydrocarbons, brine, and sulfur have been extracted from the salt dome, and there is evidence of oil and gas exploration and development on the south and northeast sides of the dome. Sulfur production occurred between 1955 and 1970 along the northeastern part of the dome. The Texas Brine Company operates three brine caverns in the south-central dome area. With the exception of the brining operations, no other activities are present on the dome. Most land available for facility construction is located at the west end of the dome.

A single road to the former sulfur mining area crosses part of the dome. Shell-gravel roads flank the southern and western perimeter of the site, providing potential access to oil and gas wells. The Donner barge canal traverses the western perimeter of the dome and provides access to the dome from rail connections several miles south.

The Chacahoula area was in the path of Hurricane Katrina and, as a result, there was substantial damage to housing and other facilities in the region, most substantively along the coast. The area is still recovering from this damage. The proposed Chacahoula site received only minor direct effects from the hurricane because it is located in undeveloped wetlands.

The proposed Chacahoula site would be enclosed by a perimeter road, fence, and cleared security buffer area. The ROW associated with the RWI system would follow an existing pipeline and a 4.3-mile (6.8-kilometer) access road would be built along the pipeline route toward Highway 90. The brine disposal system to an offshore diffuser in the Gulf of Mexico would follow an existing pipeline ROW. The crude oil pipeline would follow the existing Shell pipeline, while the pipeline to the St. James terminal would follow an existing crude oil pipeline to the terminal.

#### **3.3.4.2 Potential Impacts**

##### **3.3.4.2.1 Possible Land Use Conflicts**

Historically, the Chacahoula site area has land uses associated with oil and gas development and other industrial developments such as Texas Brine Company's brine operations. Railroads, canals, and other infrastructure and development have disturbed a portion of other land in the vicinity. Because the proposed site is in an industrial area largely covered by wetlands, the land would not be useful for many land use purposes. Wetlands areas on the proposed site would remain interconnected with those outside the site. If an SPR storage facility were located on the proposed site, land use patterns would not change in any substantial way. No national or state parks or other specially designated land is located on or near the proposed Chacahoula SPR site. Overall, there would be minimal conflict with established land uses for the Chacahoula site.

No residential, commercial, or specially designated areas are located in or near the pipelines, power lines, RWI system, or other infrastructure for the Chacahoula site. Section 3.3.2.1 describes common land use impacts associated with construction and operation and maintenance of new and expansion sites and associated infrastructure not located in such areas.

##### **3.3.4.2.2 Visual Resources**

No special visual resource issues are associated with this SPR site location and its associated infrastructure, which are generally located in rural, undeveloped areas. Section 3.3.2.2 describes common visual impacts associated with construction and operation and maintenance of new sites and associated infrastructure.

#### **3.3.4.2.3 Coastal Zone Management**

The Chacahoula site in Lafourche Parish is not covered in the Louisiana Coastal Management Program; therefore, the proposed storage site would have no special environmental requirements related to coastal management. Portions of the site infrastructure, however, such as parts of the crude oil and brine pipelines would be built in the coastal zone. DOE will coordinate with the Louisiana Department of Natural Resources, Coastal Management Division to identify and address any coastal zone issues associated with the infrastructure for the Chacahoula site.

### **3.3.5 Clovelly Storage Site**

#### **3.3.5.1 Affected Environment**

The proposed Clovelly SPR site is about 5 miles (8.0 kilometers) east of Galliano in Lafourche Parish, LA (see figures 2-4.3-1 and 2.4.3-2). Recreation opportunities in the area include hunting, fishing, boating, bird watching, and nature photography. The proposed site would be located near Bayou Lafourche and State Highway 1 in wetlands and would be mostly underwater. Uplands in the area are used primarily for sugar cane fields and cattle grazing. Communities along Highway 1 near the proposed site exist include Golden Meadow, Galliano, Cut Off, Larose, Lockport, and Rockland, which have a combined population of more than 35,000 people.

The area has a long history of oil- and gas-related activity. The existing Clovelly Dome Storage Terminal is part of the LOOP project (see section 2.4.3 for further information). The control center in Galliano manages all of the LOOP operations. If DOE selects an alternative that includes this site, the SPR operation would use the existing LOOP oil distribution infrastructure and LOOP would operate the facilities for DOE. In addition, a new onsite RWI would be required.

The Clovelly area was in the path of Hurricane Katrina, and housing and other facilities in the region received substantial damage, mostly along the coast. The area is still recovering from this damage. The proposed Clovelly site, however, received only minor direct effects from the hurricane.

#### **3.3.5.2 Potential Impacts**

##### **3.3.5.2.1 Possible Land Use Conflicts**

Although the Clovelly site would be a new SPR location, SPR facilities would not be a new land use in the area. The existing LOOP operations include private (nongovernmental) storage of petroleum at Clovelly salt dome. DOE's potential use of Clovelly as a part of the SPR would include the co-use of the site with LOOP operations. From a land use perspective, SPR construction and operations and maintenance activities would impose few identifiable impacts other than slightly increasing surface disturbance and industrial activity in the area. Considering the existing wetlands and industrial nature of the site, the land is not compatible with or desirable for most other purposes. Land use patterns would not change in any substantial way if DOE selects this proposed site.

Construction of the associated caverns for the proposed Clovelly SPR site would be on land currently containing soil from previous LOOP construction areas. Because the construction would take place in areas previously used for similar purposes, the land use impacts would be negligible.

The proposed Clovelly SPR site would use the LOOP's existing brine disposal system and brine diffuser system and the new RWI would be built onsite. No land use impacts from those activities would be expected.

#### **3.3.5.2.2 Visual Resources**

No special visual resource issues are associated with this proposed SPR storage site and infrastructure because the area is already heavily developed and industrial. Section 3.3.2.2 discusses common visual impacts associated with construction and operations and maintenance of proposed new SPR sites and their associated infrastructure.

#### **3.3.5.2.3 Coastal Zone Management**

Clovelly is within the Louisiana designated coastal zone, and coastal zone management requirements would apply to this SPR site. The Lafourche Parish coastal management program includes the following goals:

- Slow down the rate of saltwater intrusion into the environmental management unit;
- Maintain the integrity of the relatively undisturbed brackish wetlands area in the north and northeast section of the site by imposing mitigation conditions on any dredge and fill permits issued in this area that retard wetlands deterioration;
- Reduce erosion of the strip of land between Little Lake and the eroded wetlands north of Bayou L'Ours;
- Reduce erosion of the strip of natural levee of Bayou L'Ours running east and west between two rapidly eroding wetlands areas; and
- Maintain LOOP activities and support any applicable mitigation plans developed for the area under the jurisdiction of the Lafourche Parish Coastal Management Program.

If DOE selects the Clovelly site as a new SPR site, DOE and the LOOP owners and operators would cooperate to ensure the implementation of these and any other future Coastal Management Program goals. DOE will continue to interact with the Louisiana Department of Natural Resources, Coastal Management Division, as needed to fulfill its coastal zone management responsibilities for the Clovelly site. This process is summarized in section 3.3.1.4 above.

### **3.3.6 Clovelly and Bruinsburg Storage Sites**

#### **3.3.6.1 Affected Environment**

The affected environment and potential impacts of the Clovelly-Bruinsburg combined candidate site are largely the same as those for the Clovelly site (80 MMB and 90 MMB alternatives) plus the Bruinsburg site, as described above. The footprint of the Bruinsburg storage site, including the security buffer, however, would be smaller. For example, the storage site would be 254 acres (103 hectares) instead of 364 acres (147 hectares) and 30 instead of 60 injection wells would be built. For purposes of the land use analysis, the differences in the configurations and operating plans at each facility are listed below and described further in section 2.4.4:

- The crude oil pipelines from Bruinsburg to Anchorage, LA, and to Peetsville, MS would not be built. In addition, the terminals in Peetsville would not be built.

- A crude oil pipeline would be constructed to connect to the Vicksburg Entergy system near Vicksburg, MS. SPR would use the existing terminal at Vicksburg, MS.
- A crude oil pipeline would be built to Jackson, MS, connecting to the Capline Jackson Pump station.
- A new 71-acre (28-hectare) terminal with a tank farm would be built at Jackson next to an existing pipeline pump station. The terminal's design would be similar to the proposed terminal at Peetsville, MS, for the Bruinsburg 160 MMB site.

### **3.3.6.2 Potential Impacts**

The construction and operation of these pipelines would not present any land use conflicts, except possibly where the pipeline crosses the Natchez Trace National Scenic Trail and the Natchez Trace Parkway. These potential conflicts would be the same as described in section 3.3.3 for the pipeline to Peetsville for the Bruinsburg 160 MMB site. The proposed terminal at Jackson is in a largely agricultural and forested area near the Town of Raymond, MS. The tank farm would be compatible with existing land uses in the area.

## **3.3.7 Richton Storage Site**

### **3.3.7.1 Affected Environment**

The proposed Richton site would be in Perry County, MS, 3 miles (4.8 kilometers) from the Town of Richton (see figures 2.4.5-1 through 2.4.5-3). The proposed site on the Richton salt dome, including security buffer, would encompass about 346 acres (140 hectares). Land in Perry County is used primarily for agriculture and forestry. The County's major crops are corn, sorghum, soybeans, and wheat. More than 80 percent of the County is forested land, some of which is harvested as timber. Slightly less than half of the forestland in Perry County lies in De Soto National Forest, which is managed by the U.S. Forest Service.

There is no hydrocarbon production in the dome area and the potential for future production is low. Sulfur and oil have been found near the dome, but not in commercial quantities. Several small oil and gas fields are located within 10 miles (16 kilometers) of the dome.

A substantial portion of the proposed SPR site is privately owned and primarily used for forestry and agriculture. The proposed SPR site includes a working plantation of slash pine and a small chicken farm located on the southwest corner of the site. Some land is used for recreation such as hunting. A golf course is adjacent to the proposed SPR site, and private homes are east of the proposed site along a road on the southern portion of the property. Two utility corridors cross the dome.

SPR development for the Richton site would include two dual-purpose (crude oil and brine) pipelines to Pascagoula and an oil distribution pipeline to Liberty Station, MS, where it would connect to the Capline pipeline. DOE would build tank farms and other terminal facilities at both locations, as shown in figures 2.4.5-4 and 2.4.5-5. The 63-acre (25-hectare) Pascagoula terminal would be located on the Naval Station Pascagoula Base Realignment and Closure site, which is on the north side of manmade Singing River Island. The site lies just south of the main port of Pascagoula. The dock at Pascagoula would be refurbished. The only in-water construction would be piling installation using barges. The proposed 66-acre (27-hectare) terminal at Liberty Station would be in an agricultural and forested area with some industrial uses, including oil distribution facilities. The Town of Liberty is located within 2 miles (3.2 kilometers) of the proposed site.

The Richton area was in the landfall path of Hurricane Katrina and the area received some water and wind damage. The area largely has returned to pre-hurricane conditions.

### **3.3.7.2 Potential Impacts**

#### **3.3.7.2.1 Possible Land Use Conflicts**

The proposed Richton site has no history of oil- and gas-related activity at or near the site. Constructing, operating, and maintaining the Richton site as an SPR facility would generally be a new land use that would preclude other future land uses. It would change existing land conditions and characteristics. The land ownership and land use changes would be long-term. Section 3.3.2.1 discusses common land use impacts associated with the construction and operations and maintenance of the proposed new SPR sites and associated infrastructure.

Construction of pipelines and utilities in new ROWs for the Richton site would constitute a new long-term land use commitments. DOE found that no parks, forests, or other specially designated lands, residential, or commercial areas would be crossed by the RWI structure or the brine disposal system. The pipeline to Liberty Station, MS, however, would cross the Percy Quin State Park for about 0.5 miles (0.7 kilometers) in a new ROW. If a Richton alternative were selected, DOE would work with the state of Mississippi to re-align the pipeline to cross the park in an existing ROW.

DOE expects no substantive land use impacts associated with the terminal facilities in Pascagoula or Liberty Station because they would be located in areas that have existing industrial uses. The facility development would not constitute a new type of land use in the area.

#### **3.3.7.2.2 Visual Resources**

There are no special visual resource issues associated with the construction and operation and maintenance of the Richton storage site, RWI structure, or brine disposal system. Section 3.3.2.2 describes common visual impacts associated with construction and operations and maintenance of new SPR sites and associated infrastructure.

Visual impacts could be associated with the crude oil pipeline segment through the Percy Quin State Park. This park may be frequented by sightseers who may be sensitive to the changes in visual quality. Construction of the ROW would cause temporary disruption to the landscape in the form of dust, emissions from construction equipment, and trenches. As part of the proposed action, the pipeline would be underground and DOE would attempt to preserve the natural landscape. One section of the pipeline would be located approximately 240 feet (73 meters) from residential areas. Residents in these nearby areas might be affected by pipeline construction activities during the six- to 10-week construction period, and they might be sensitive to corresponding changes in the visual landscape. Long-term effects of the pipeline would be minimal since the pipeline would be buried and only the ROW and the power lines along the ROW to the RWI might contrast with the visual landscape.

#### **3.3.7.2.3 Coastal Zone Management**

Because the Richton storage site would not be in the designated Mississippi coastal zone, there would be no special coastal zone management requirements as part of any land use at a proposed SPR site. The potential use of the Pascagoula Singing River Island as a terminal site must be considered as a potential impact to coastal zone resources since it is in the coastal zone. DOE will coordinate with the Mississippi Department of Marine Resources to identify and address any coastal zone issues associated with the Pascagoula site.

### **3.3.8 Stratton Ridge Storage Site**

#### **3.3.8.1 Affected Environment**

The Stratton Ridge site is in south-central Brazoria County, TX 3 miles (4.8 kilometers) from both Clute, TX, and Lake Jackson, TX (see figures 2.4.6-1 through 2.4.6-3). The site is characterized by surrounding wetlands, bayous, lakes, and creeks. The Stratton Ridge site is an uplands area despite its relatively low elevation.

Regional land has a mix of industrial and rural uses. The site would encompass 370 acres (150 hectares) including the security buffer and would be directly west of the Brazoria National Wildlife Refuge, which is managed by the USFWS. The petrochemical industry is substantial in the local economy. Dow Chemical operates a major commercial chemical facility that uses salt from the Stratton Ridge salt dome to produce chlorine and to manufacture many products. Other economic activity includes cattle ranching and farming. Rice is the major crop. The area also has a long history of oil- and gas-related land use. The Stratton Ridge site has been used for brine and petroleum storage in a wide range of cavern sizes. These storage caverns are privately owned. These regional land uses have co-existed for many years.

DOE would need to acquire the land including mineral rights on the salt dome for the proposed SPR storage site from private owners. Under current conditions, cattle and feral pigs roam throughout the site and their presence and activities, such as grazing and burrowing, influence the vegetation communities. Pipeline, power line, and rail ROWs cross through the site and nearby areas. The Freeport Liquefied Natural Gas project has proposed building a nearby natural gas storage cavern, which would be constructed along the northern border of the proposed SPR site. Surrounding land generally is used for cattle ranching or low-density residential areas. Across the highway from the proposed site is a field used by the Brazoria County model airplane club.

Approximately 3 miles (5 kilometers) of the co-located RWI pipeline, brine disposal pipelines, and two power lines to the RWI would cross the southwestern edge of the Brazoria National Wildlife Refuge, which is part of the Texas Mid-Coast National Wildlife Refuge Complex. Also, 4.7 miles (7.6 kilometers) of the crude oil pipeline to Texas City would cross the refuge along its northern border adjacent to the existing Bryan Mound pipeline ROW. The Brazoria National Wildlife Refuge provides habitat for migratory waterfowl and other birds. In addition, a section of a brine disposal pipeline would pass near a small section of houses near the Gulf Coast in an existing publicly owned ROW. This pipeline may result in the need for a new road and additional road improvements.

The proposed RWI structure would be located on the coastal side of the ICW across the waterway from the Brazoria National Wildlife Refuge (figure 2.4.6-3). DOE also would construct a 1,000-foot (300-meter) new road from Bay Street to the RWI structure.

Hurricanes Katrina and Rita did not substantially affect the Stratton Ridge area.

#### **3.3.8.2 Potential Impacts**

##### **3.3.8.2.1 Possible Land Use Conflicts**

The SPR facilities at the proposed storage site would be a new land use that would be consistent with industrial land use in the area. SPR development would preclude other long-term land uses at this site, such as possibly precluding the use of the Stratton Ridge salt for chlorine production by Dow Chemical. Regional land use patterns, however, would not change substantially. There would be no substantive

conflict with other established land uses because of existing industrial development in the area, including petroleum storage. With careful planning, multiple SPR and private cavern storage operations could co-exist at the site. No specially designated lands, residential, or commercial areas are within or adjacent to the Stratton Ridge storage site.

About 3 miles (4.8 kilometers) of the RWI pipeline, brine disposal pipelines, and two power lines in the same new ROW would cross the Brazoria Wildlife Refuge and privately owned land in the refuge's proclamation area. In addition, 4.7 miles (7.6 kilometers) of the crude oil pipeline would cross the refuge on the northern border in an existing ROW. These ROWs would create land use conflicts and an act of Congress may be required to allow this development through the refuge. The new and expanded ROWs would be cleared and trees would not be allowed to regrow within the permanent easement. The remaining area affected by construction would be allowed to regenerate to natural habitat. Visitors to the refuge would likely value undeveloped and undisturbed land.

Mitigation: If the Stratton Ridge site were selected, DOE would coordinate with the USFWS to obtain the proper ROW easements. DOE would work with USFWS to ensure that land use conflicts are minimized to the maximum extent practicable, including burying the power lines through the refuges. For further discussion of potential mitigation measures, see section 3.7.8.2.2.

A short pipeline that would pass near houses near the Gulf Coast would not create a land use conflict because it would be located underground in a publicly ROW and would not interfere with existing land uses.

The proposed RWI site would be located within and along the shoreline of the ICW across from the border of the Brazoria National Wildlife Refuge. The potential noise impact from the operation of the RWI pumps is discussed in sections 3.7.8.2.3 and 3.10.2.

#### **3.3.8.2.2 Visual Resources**

Visual impacts may be associated with the construction of the pipelines and power lines through the wildlife refuge. Recreational sightseers visiting this special status area might be sensitive to changes in visual quality. Construction of the new and expanded ROW segments would cause temporary impacts to the viewshed. DOE would attempt to preserve the natural landscape setting by placing the pipelines and power lines underground, supporting post-construction wetlands regrowth, and working with USFWS to minimize and mitigate any impacts to the refuge. ROW maintenance activities would occur infrequently and would only temporarily disturb revegetated land, thereby minimizing any long-term visual impacts of the ROWs (see section 3.7.8.2 for the discussion of potential mitigation measures).

Potential visual impacts may be associated with the RWI located on the ICW across from the Brazoria National Wildlife Refuge. The area around the RWI system would consist of shorter marsh types of vegetation, and would contrast greatly with the surrounding landscape. Users of the wildlife refuge may be sensitive to such a change in the landscape.

#### **3.3.8.2.3 Coastal Zone Management**

The Stratton Ridge site and associated infrastructure is within the Texas coastal zone. DOE will continue to interact with the Texas General Land Office, Coastal Resources Program as needed to fulfill its coastal zone management responsibilities for the Stratton Ridge site. This process is summarized in section 3.3.1.4 above.

### **3.3.9 Bayou Choctaw Expansion Site**

#### **3.3.9.1 Affected Environment**

Bayou Choctaw is a current SPR storage site (see figures 2.5.1-1 and 2.5.1-2). DOE would not be required to purchase any additional land to expand capacity by 20 MMB. To expand capacity by a further 10 MMB, however, DOE would purchase 4 acres including an existing privately owned storage cavern. The site is located about 8 miles (13 kilometers) from Plaquemine, LA, and just east of the ICW.

The extensive water diversions and flood control structures throughout the area have made water levels at the site particularly uncertain; however, the existing SPR site is normally dry and protected from spring flooding by the site's flood control levees and pumps. The area surrounding the site is fresh water wetlands, which includes substantial stands of bottomland hardwoods with interconnecting waterways. The original cypress wetlands at the SPR site was clear-cut long before SPR development began.

The Choctaw oil and gas field was already a mature producer before the advent of SPR oil storage. The region has experienced widespread petroleum extraction activity; however, most wells in the area have been abandoned.

DOE has six operating SPR caverns on the salt dome. Union Texas Petroleum operates seven hydrocarbon storage caverns and two brine caverns on the dome, interspersed with the SPR caverns. Union Texas Petroleum's operations on the dome support the local petrochemical industry. Two new caverns are proposed to be solution mined and one existing cavern would be acquired from an adjacent storage facility. In addition, DOE would construct six new underground injection wells and associated 0.6-mile (0.9-kilometer) extension of the brine disposal pipeline from the existing wells to the new wells.

Hurricane Katrina passed near the Bayou Choctaw area after it made landfall. The nearby Baton Rouge area served as a major source of housing to hurricane evacuees from the primary damage areas on the Louisiana coast. While there was substantial disruption of economic activity in the area, the Bayou Choctaw SPR site was not substantively affected by the hurricane or the relocation effects from evacuees.

#### **3.3.9.2 Potential Impacts**

##### **3.3.9.2.1 Possible Land Use Conflicts**

Expansion of the SPR at this existing site, including the underground injection wells, would maintain current land use at the site and in the region. Construction activities would require some additional site disturbance, but this disturbance would not conflict with any existing SPR operations or represent a change in existing land use. Given the existing SPR operations at the site, the land would not be compatible with or desirable for nonindustrial purposes. Land use patterns would not change in any substantial way with SPR expansion. Section 3.3.2.1 describes common land use impacts associated with expansion and operations and maintenance of existing SPR sites and associated infrastructures.

##### **3.3.9.2.2 Visual Resources**

Bayou Choctaw is an existing SPR site. There are no special visual resource issues associated with the proposed expansion at this SPR site. Section 3.3.2.2 describes common visual impacts associated with expansion of existing SPR sites and associated infrastructure.

### **3.3.9.2.3 Coastal Zone Management**

Because the Bayou Choctaw site would not be in the designated Louisiana coastal zone, there would be no special coastal zone management requirements as part of any land use as an SPR site.

## **3.3.10 Big Hill Expansion Site**

### **3.3.10.1 Affected Environment**

The existing Big Hill SPR storage site is located in southwestern Jefferson County, TX (see figures 2.5.2-1 and 2.5.2-2). It is in a small industrial area with large croplands and pastures to the north and west, and extensive wetlands to the south and southeast that stretch to the Gulf Coast. Most of the storage site is uplands habitat consisting of tall grass.

The closest residential areas are 5 miles (8 kilometers) away near the unincorporated communities of Winnie and Stowell. The area is a major waterfowl area with extensive recreational opportunities such as hunting and bird watching. Agricultural production is the primary land use in Jefferson County; TX, more than half of the acreage in the County is dedicated for farming. Oil and gas production constitutes the other major land use activity in the County with commercial marine and crude oil pipeline distribution facilities nearby.

DOE would develop additional SPR caverns in a 210-acre (83 hectares) area, including the security buffer, directly north of the current storage site. Private parties separately own the proposed expansion site and its mineral rights. While two 0.5-MMB liquid petroleum gas storage caverns are located just north of the proposed expansion area, these operations are not expected to pose any construction or operational issues for the expansion.

The Big Hill area was in the path of Hurricane Rita. Damage to the coast south of the site was extensive, and the urban areas nearby sustained some losses from flooding and wind. Power in the Big Hill area, including for the Big Hill SPR facility, was lost for a short time. The area is still recovering. The Big Hill SPR site did not suffer any substantial permanent damage.

### **3.3.10.2 Potential Impacts**

#### **3.3.10.2.1 Possible Land Use Conflicts**

Because Big Hill is a current SPR site, any expansion could take advantage of the existing infrastructure. Construction necessary to expand the facility would be limited primarily to preparing the site, solution mining the new storage caverns, building a new brine pond, installing an additional crude oil pipeline along an existing ROW, and refurbishing the existing brine pipeline. Considering the existing SPR operations at the site, the land would not be compatible with or desirable for most nonindustrial purposes. Expansion of the SPR facilities would not change land use patterns in any substantial way. There would be minimal conflict with other established land uses. No specially designated lands are present at the Big Hill expansion site.

The crude oil and brine pipeline ROWs are in existing and maintained corridors. The crude oil pipeline ROW for the proposed Big Hill site expansion would pass within 0.25 miles (0.4 kilometers) of the J.D. Murphee Wildlife Management Area (see figure 2.5.2-1 in chapter 2). The construction corridor would expand only a short distance out of the existing pipeline ROW. It would not overlap with the management area. Land disturbance along pipeline ROWs would be limited to the construction period.

Thus, infrastructure associated with the Big Hill site would have minimal conflicts with existing land uses.

#### **3.3.10.2.2 Visual Resources**

The expanded crude oil pipeline ROW would pass within 0.25 miles (0.4 kilometers) of the J.D. Murphee Wildlife Management Area. Because the construction corridor would not overlap with the Management Area and the pipelines would be buried underground, visual impacts would be limited to the construction period.

#### **3.3.10.2.3 Coastal Zone Management**

The Big Hill site and associated infrastructure is within the Texas coastal zone. DOE will continue to interact with the Texas General Land Office, Coastal Resources Program as needed to fulfill its coastal zone management responsibilities for the Big Hill site. This process is summarized in section 3.3.1.4 above.

### **3.3.11 West Hackberry Expansion Site**

#### **3.3.11.1 Affected Environment**

The West Hackberry site is an existing SPR storage facility covering about 570 acres (230 hectares) in Cameron Parish, LA, about 4 miles (6 kilometers) from the town of Hackberry (see figures 2.5.3-1 and 2.5.3-2). The West Hackberry storage site and immediately surrounding area are flat to low wetlands with the exception of the elevated area overlying the salt dome south and southeast of Black Lake. Originally, DOE acquired five previously developed brine caverns and converted them to oil storage capacity. DOE has since developed 17 additional storage caverns at the site. About 53 acres (21 hectares) of privately owned land would be developed for the SPR expansion, though a larger parcel would be purchased.

The major historical land use of the area has been oil and gas exploration and development. While the site was explored for sulfur, DOE has no records indicating that the dome was mined for sulfur. Olin Corporation and its predecessors have been producing brine at the dome since 1934. Five of the caverns derived from their brine operations formed the initial storage sites for the SPR program at West Hackberry. Other caverns historically have been used for hydrocarbon product storage.

The West Hackberry site was in the path of Hurricane Rita. Effects along the coast south of the site were extensive, with substantial loss of housing and other structures because of flooding and wind. The West Hackberry SPR site was affected by precipitation and wind from the hurricane, but the area received no substantial long-term effects.

#### **3.3.11.2 Potential Impacts**

##### **3.3.11.2.1 Possible Land Use Conflicts**

Expanding this existing storage site would maintain current land use at the site and in the region. Construction activities would require additional site disturbance, but this disturbance would not conflict with any existing SPR operations or surrounding land uses. Considering the existing SPR operations at the site, the land would not be compatible with or desirable for most nonindustrial purposes. Expanding the facility would not change land use patterns in any substantial way. There would be minimal conflict

with other established land uses. Section 3.3.2.1 describes common land use impacts associated with expansion and operations and maintenance of existing SPR sites and associated infrastructures.

While the expansion would use existing infrastructure such as the existing RWI system, concerns for additional SPR use at the West Hackberry site would include site susceptibility to potential complications from tidal influences and heavy precipitation events. Additional site controls such as water barriers, canals, or pumps may be necessary to keep the storage site dry. The additional site controls would have minimal land use impact and, if they are needed, would allow for continued safe and effective SPR operations.

#### **3.3.11.2.2 Visual Resources**

West Hackberry is an existing SPR site. There are no special visual resource issues associated with expanding storage capacity at this site. Section 3.3.2.2 describes common visual impacts associated with expansion and operation and maintenance of existing SPR sites and associated infrastructures.

#### **3.3.11.2.3 Coastal Zone Management**

The West Hackberry area is within the Louisiana designated coastal zone, and coastal zone management requirements would apply to this site. Coastal zone objectives in the two nearby environmental management units (Hackberry and West Black Lake) address the following issues:

- Reduce the subsidence potential from non-environmental sources;
- Reduce the water level in the environmental management units and reduce the chance of future flooding;
- Inhibit saltwater intrusion;
- Restore vegetation and remove environmental management units from tidal action;
- Restore bank to inhibit shoreline erosion;
- Encourage development in areas that are best suited for growth;
- Limit flood hazard potential as much as possible;
- Limit harmful effects of community waste while ensuring efficient treatment of this waste;
- Restrict the use of having detrimental effects to water resources in sensitive areas; and
- Plan for orderly growth in communities with the resources to accommodate it.

If DOE expanded SPR operations at the site, DOE would continue to be responsible for supporting these management goals. DOE will continue to interact with the Louisiana Department of Natural Resources, Coastal Management Division, as needed to fulfill its coastal zone management responsibilities for the Clovelly site. This process is summarized in section 3.3.1.4 above.

#### **3.3.12 No-Action Alternative**

The no-action alternative would limit the impacts from SPR construction and operation to those that have already occurred or that will occur at the existing SPR storage sites at Bayou Choctaw, Big Hill, Bryan Mound, and West Hackberry. The existing environments for the proposed new SPR storage site alternatives would be maintained. The Bruinsburg storage site would likely remain in agricultural use because of the lack of development pressure. The Chacahoula storage site could remain undeveloped. Existing oil and gas activities occur near the Chacahoula storage site the proposed site could be developed

by a commercial entity for oil and gas purposes. The Richton site would likely remain in use as a pine plantation because of the lack of development pressure. Dow, British Petroleum, Conoco, and Occidental energy companies have storage facilities on the Stratton Ridge dome and it is possible that the Stratton Ridge storage site could be developed for cavern storage by a commercial entity. The onshore Clovelly Dome Storage system would continue to operate unchanged as a component of LOOP with the exception of any expansion that LOOP might undertake. For the sites of terminals that are in developed petroleum storage areas, it is possible that a commercial entity could develop them for petroleum storage.